How To IDENTIFY GNOMONIA AND DIAPORTHE CANKERS

AND SHOOT BLIGHT DISEASES OF YELLOW BIRCH

North Central Forest Experiment Station
Forest Service
U.S. Department of Agriculture

Reproducing yellow birch in northern hardwood forests in the north-central States is difficult. Animal browsing and competition from other tree species have contributed to the decline in birch seedling numbers, but canker and shoot blight fungus diseases caused by **Diaporthe alleghaniensis** and **Gnomonia setacea** also take a great toll.

Yellow birch trees are susceptible to these two diseases until they reach the small sapling stage. Symptoms are virtually identical, except that **Gnomonia** causes a leaf spot while **Diaporthe** does not. Positive identification is possible either by examining the fruiting bodies on diseased plants or by culturing.

No direct control is known for these diseases, but their impact can be minimized by maintaining optimal conditions for tree growth: seedlings subjected to poor site conditions or severe competition are most susceptible to infection.

For more information on these diseases contact:

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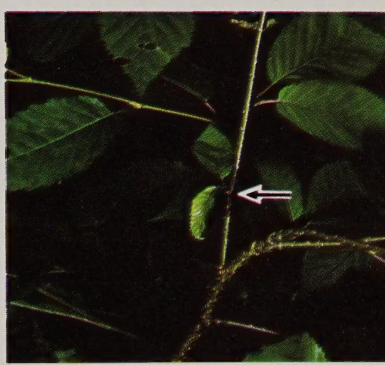
CANKERS AND SHOOT BLIGHT

Cankers appear in spring and early summer. At first they are confined to the outer bark, but later inner bark and even wood may become infected and discolored. In spring, cankers girdle new shoots and cause a shoot blight stage of the disease. Such stems may develop a characteristic "shepherd's crook." During summer, cankers girdle older woody stems, particularly when the cankered trees are subject to drought. The first indication of imminent girdling is a wilting and browning of the foliage. Brown leaves tend to remain attached to the girdled stems for several months. Cankers are black in color and may appear sunken because of a combination of collapse of bark cells and growth of healthy surrounding tissue.

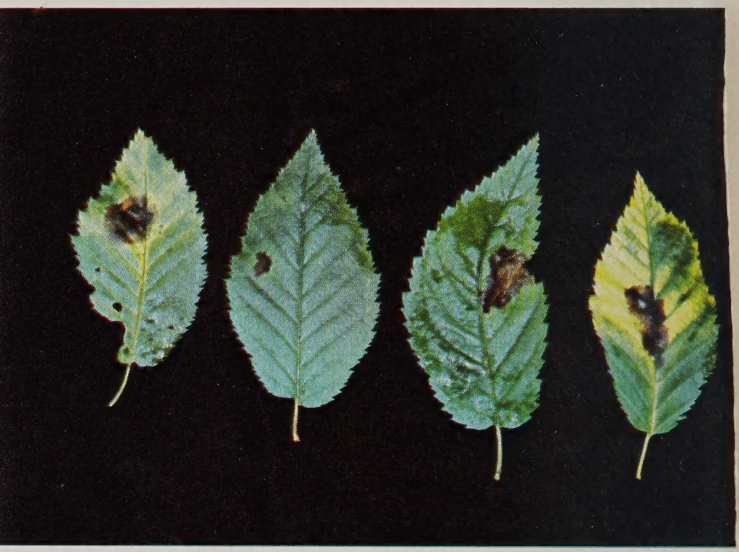
Look for: Browning of leaves during summer . . .

And for: Black, sunken areas on stems during spring and summer.



LEAF SPOT (GNOMONIA)

Look for: Brown, irregularly shaped spots, sometimes delineated by major veins.



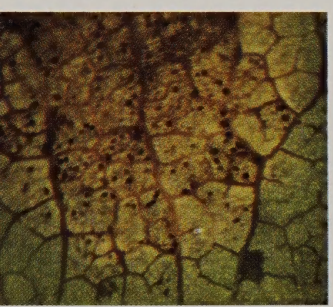
Leaf spots develop throughout the growing season but are usually more prevalent from midsummer onward. Ranging up to an inch in diameter, these spots are found on yellow birch trees of all sizes. The larger spots may be surrounded by lighter colored chlorotic zones.

FRUITING STRUCTURES AND SPORES

Look for: Small fruiting bodies that produce hyaline conidiospores.

Gnomonia

Fruiting bodies (acervuli) develop under the cuticle of leaf epidermal cells within the spots or on stems.

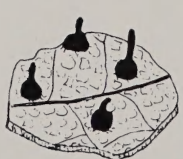


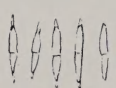
Diaporthe

Fruiting bodies (pycnidia) develop within dead stem bark.

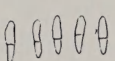
Later, another kind of fruiting body occurs (perithecia) that produces two-celled ascospores.

Perithecia develop on spotted leaves after they drop to the ground. Ascospores produced within the perithecia have indistinct appendages at both ends.





Perithecia occur in clusters within stem bark. Ascospores bear no apical appendages.



CULTURING TECHNIQUES

Cut cankered stems into small sections with a pair of sharp hand pruners. Place sections in full strength hypochlorite household bleach for 5-10 minutes. Remove sections from bleach, insert into sucrose-yeast agar in petri dishes, and incubate at 20° C for 2 weeks.

Gnomonia

Produces acervulus stage abundantly (particularly within the agar medium). Mycelial growth pattern definitely zonate. Aerial mycelium cottony-feathery.

Diaporthe

Produces pycnidial stage (some cultures do not). Mycelial growth pattern sometimes somewhat zonate. Aerial mycelium woolly-felted.

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